

REMARKS

1. Amendments to Claims

Independent Claim 1 has been amended as above to more specifically define the features of the present invention. In particular, claim 1 now recites that:

- (1) In the step of forming shallow trench isolations in said intermediate structure, the shallow trench isolations have different depths. This amendment is **supported by lines 17-21 on page 1** of the original specification (and by page 3, lines 3-4, which point out that the isolation-forming step involves the “known process shown in Fig. 1,” described in the above-cited lines on page 1.
- (2) The step of forming an oxide layer on the whole structure causes the portions of the oxide layer at the shallow trench isolations having different depths to have different heights. This amendment is **supported by 26-28 on page 1 of the original specification**, which points out that “*the height difference between the top of the planarized oxide layer 30 and the top of the substrate of the active region is referred to STI step,*” and further points out that “*since the overfill thicknesses of the oxide are different, after planarization, the STI steps in the regions of STIs of different depth are different.*”
- (3) The step of forming a planarization material layer on said oxide layer offsets the different thicknesses such that said planarization material layer has a substantially planar top surface. The recitation of the planar top surface resulting from the planarization layer is **supported by Fig. 5** and by the description of step uniformity in **lines 16-19 on page 3** of the original specification.

Because the amendments to the claims are fully supported by the original specification, it is respectfully submitted that they do not involve ‘new matter.’

2. Rejection of Claims 1 and 4-6 Under 35 USC §102(b) in view of U.S. Patent No. 5,721,172 (Jang)

This rejection is respectfully traversed on the grounds that the Jang patent fails to disclose the claimed planarization step which eliminates the offset or STI step non-uniformity between

the shallow and deep STI regions. In fact, the Jang patent does not disclose any step non-uniformity, much less a solution to the problem of step non-uniformity.

The problem of height difference or step non-uniformity in regions of different depth is shown in Fig. 3 of the present application. Fig. 5 shows the effect of the claimed invention in eliminating this offset or height difference. By eliminating the offset or height difference, the invention eliminates short circuits between the gates or between the gate and bit line caused by “gate stringer.”

In contrast, Fig. 3 of the Jang patent shows that all the narrow trenches 31 and the wide trench 33 all have the same depths, and therefore there is no need for the claimed offset-eliminating planarization layer. Although the conformal trench fill dielectric layer 36 and the conformal second polish stop layer 38 at the narrow trenches 31 and wide trench 33 of Jang have different heights, this does not create an offset of the type eliminated by the present invention because of the uniform depths. Therefore, the Jang patent could not possibly anticipate, or suggest, the step of forming a planarization material layer on the oxide layer to offset the different heights, as required by the above amendment of the present application. In fact, as described in column 9, lines 31-35 and shown in Fig. 4 of the 172, the dielectric layer 36 and the polish stop layer 38 are planarized through a CMP planarizing method in a manner similar to the prior art described in lines 26-31 on page 1 of the original specification. In contrast, claim 1 of the present application specifically recites that the planarization process is to remove a planarization material layer in order to planarize the top surfaces of the oxide layer and the pad nitride layer.

Since the Jang patent does not disclose or suggest either the problem of STI step non-uniformity or the claimed solution of forming a planarization material layer to offset the different heights (which are not even present in the Jang structure), withdrawal of the rejection of claims 1 and 4-6 under 35 USC §102(b) is respectfully requested.

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Having thus overcome the sole rejection made in the Official Action, expedited passage of the application to issue is requested.

Respectfully submitted,

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